Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (Previously Presented): An electrospray mass spectrometer fitted with an electrospray ion source, said ion source comprising a structure supporting a nebulization nozzle, a sampling orifice, a heated desolvation chamber and a control knob supporting a support rod, said nebulizing nozzle having an axis and said sampling orifice having an axis, the axis of the nebulization nozzle intersecting the axis of the sampling orifice, said electrospray ion source further comprising a movable desolvation chamber having a direction-changing channel and being supported from said support rod such that the movable desolvation chamber can be moved off the axis of the nebulization nozzle in an electrospray ionization mode and set on the axis of the nebulization nozzle in a cold-spray ionization mode wherein liquid droplets are introduced from an opening from the nebulization nozzle and pass through the direction-changing channel such that sample ions are discharged from an exit opposite to the sampling orifice.

Claim 2 (Original): The electrospray mass spectrometer of claim 1, wherein said nebulization nozzle consists of a capillary for guiding a sample solution supplied from a sample inlet port and a pipe for guiding a nebulizing gas introduced from a gas inlet port, said pipe coaxially surrounding the outer surface of said capillary.

Claim 3 (Presently Presented): The electrospray mass spectrometer of claim 2, wherein the temperature of said nebulizing gas is adjustable between room temperature and approximately -50°C for use of the electrospray mass spectrometer in the cold-spray ionization mode.

Claim 4 (Previously Presented): The electrospray mass spectrometer of claim 1, wherein said heated desolvation chamber is cylindrical and said nebulization nozzle is substantially coaxially inserted in a heated cylindrical desolvation chamber, the nozzle opening into the cylindrical desolvation chamber, and wherein said cylindrical desolvation chamber has a gas inlet port for introducing a heating-and-drying gas.

Claim 5 (Original): The electrospray mass spectrometer of claim 4, wherein a potential difference of 1-3 kV is imposed between said nebulization nozzle and the sampling orifice, and wherein a potential difference from zero to hundreds of volts is imposed between said cylindrical desolvation chamber and the sampling orifice.

Claim 6 (Cancelled).

Claim 7 (Original): The electrospray mass spectrometer of claim 1, wherein when a mixture of droplets of a sample and a nebulizing gas are electrostatically sprayed from said nebulization nozzle and the flow rate of sample solution is setable to 1-1,000 microliters per minute.

Claim 8 (Original): The electrospray mass spectrometer of claim 4, wherein in the electrospray ionization mode, the heating-and-drying gas is introduced into said cylindrical desolvation chamber from the gas inlet port, and wherein the introduced heating-and-drying gas and heating performed by a heater buried in an inner wall of the desolvation chamber cooperate to dry and desolvate the liquid droplets.

Claim 9 (Previously Presented): The electrospray mass spectrometer of claim 8, wherein the heater for the cylindrical desolvation chamber is controllable between 100 and 300°C.

Claim 10 (Previously Presented): The electrospray mass spectrometer of claim 8, wherein the temperature of said heating-and-drying gas is controllable between 100 and 300°C.

Claim 11 (Presently Presented): The electrospray mass spectrometer of claim 4, wherein means for cutting off the supply of the heating-and-drying gas from the gas inlet port and means to deenergize the heater buried in the inner wall of the cylindrical desolvation chamber are provided to avoid heating of the liquid droplets passing therethrough in the cold-spray mode.

Claim 12 (Previously Presented): The electrospray mass spectrometer of claim 11, wherein means are provided for supplying a cooled gas into said cylindrical desolvation chamber from the gas inlet port.

Claim 13 (Original): The electrospray mass spectrometer of claim 11 or 12, wherein temperature of said movable desolvation chamber is setable to room temperature or below in the cold-spray ionization mode.

Claim 14 (Previously Presented): The electrospray mass spectrometer of claim 1, further comprising means for setting the temperature of said desolvation chamber between room temperature and approximately 0°C in the cold-spray ionization mode.

Claim 15 (Cancelled).

Claim 16 (Original): The electrospray mass spectrometer of claim 1, wherein said movable desolvation chamber is supported by a thin support rod for heat insulation.

Claim 17 (Original): The electrospray mass spectrometer of claim 1, wherein said movable desolvation chamber is fitted with temperature control means such as a microheater, Peltier element, or sensor.

Claim 18 (Original): The electrospray mass spectrometer of claim 1, wherein a potential difference of zero to hundreds of volts is developed between said movable desolvation chamber and said sampling orifice.

Claim 19 (Cancelled).

Claim 20 (Previously Presented): The electrospray mass spectrometer of claim 1, further comprising means for setting the sampling orifice to a temperature of approximately +80°C in the electrospray ionization mode and to around room temperature in the cold-spray ionization mode.

Claim 21 (Original): The electrospray mass spectrometer of claim 1, wherein the ratio of the amount of ions relative to sample concentration produced in the cold-spray ionization mode is 1/100 to 1/1,000 of the amount of ions relative to sample concentration produced in the electrospray ionization mode.

Claim 22 (Previously Presented): The electrospray mass spectrometer of claim 1, wherein the direction-changing channel in the movable desolvation chamber is configured to pulverize the liquid droplets minutely to cause partial vaporization without heating the droplets.